

INVASIVE PNEUMOCOCCAL DISEASE SURVEILLANCE AUSTRALIA, 1 OCTOBER TO 31 DECEMBER 2015

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Summary

The number of notified cases of invasive pneumococcal disease (IPD) in the 4th quarter of 2015 was fewer than the previous quarter and less than the number of notified cases in the 4th quarter of 2014. Overall, the decline in disease due to the serotypes targeted by the 13-valent pneumococcal conjugate vaccine (13vPCV) has been maintained across all age groups, since the 13vPCV replaced the 7-valent pneumococcal conjugate vaccine (7vPCV) in the childhood immunisation program from July 2011.

Key points

In the 4th quarter of 2015, there were 316 cases of IPD reported to the NNDSS. This was a 10% reduction on the number of cases reported for the same period in 2014 (n=352) (Table 1). For the calendar year, the total number of cases was similar to 2014 (n=1,543). For the reporting quarter and the 2015 calendar year, serotypes 3, 19A and 22F were the most common serotypes, which together accounted for 24% of annual cases (Table 2).

In non-Indigenous Australians, the number of notified cases was highest in the 60–64 years age group followed by the under 5 years age group. In Indigenous Australians, notified cases were highest in the under 5 years age group followed by the 50–54 years age group (Table 3). The proportion

of cases reported as Indigenous increased to 16% compared with 11% in the [4th quarter of 2014](http://www.health.gov.au/internet/main/publishing.nsf/Content/cda-cdi3902p.htm) (<http://www.health.gov.au/internet/main/publishing.nsf/Content/cda-cdi3902p.htm>).

There were 41 cases of IPD reported in children aged under 5 years. The number of cases in this age group for this reporting period was 28% less than the 4th quarter of 2014 (n=57). Of those cases with known serotype, 24% (n=8) were due to a serotype included in either the 7vPCV or the 13vPCV compared with 40% (n=21) of cases in the 4th quarter of 2014 (Figure 1). For the 2015 calendar year, there was a small reduction in the total number of cases aged less than 5 years (n=198) compared with 2014 (n=215) and a small decline in the annual rate from 14 per 100,000 in 2014 to 13 per 100,000 in 2015. Serotypes 23B and 19A continued to be the most common serotypes affecting this age group, noting that 19A is included in the 13vPCV (Table 2).

In the 4th quarter of 2015, there were 7 cases reported in fully vaccinated children aged less than 5 years who were considered to be 13vPCV vaccine failures. For the 2015 calendar year, there were 44 13vPCV vaccine failures. Serotype 19A was reported as the cause of disease in 57% (n=4) of cases reported this period (Table 4) and 57% of vaccine failures in children aged less than 5 years this year.

Table 1: Notified cases of invasive pneumococcal disease, Australia, 1 October to 31 December 2015, by Indigenous status, serotype completeness and state or territory

Indigenous status	ACT	NSW	NT	Qld	SA	Tas.	Vic.	WA	Total qtr 4 2015	Total qtr 3 2015	Total qtr 4 2014	Year to date 2015
Indigenous	0	9	11	9	8	1	1	11	50	63	40	208
Non-Indigenous	2	78	1	39	23	12	55	22	232	453	271	1,120
Not stated/ unknown	0	10	0	0	0	0	24	0	34	73	41	171
Total	2	97	12	48	31	13	80	33	316	589	352	1,501
Indigenous status completeness* (%)	100	90	100	100	100	100	70	100	89	–	–	–
Serotype completeness† (%)	100	89	100	98	81	100	93	91	91	–	–	–

* Indigenous status completeness is defined as the reporting of a known Indigenous status, excluding the reporting of not stated or unknown Indigenous status.

† Serotype completeness is the proportion of all cases of invasive pneumococcal disease that were reported with a serotype or reported as non-typable. Serotype incompleteness may include when no isolate was available as diagnosis was by polymerase chain reaction and no molecular typing was attempted or was not possible due to insufficient genetic material; the isolate was not referred to the reference laboratory or was not viable; typing was pending at the time of reporting, or no serotype was reported by the notifying jurisdiction to the National Notifiable Diseases Surveillance System.

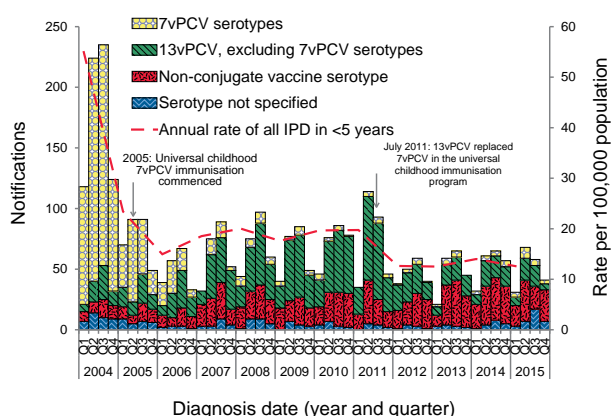
Table 2: Frequently notified serotypes of invasive pneumococcal disease, Australia, 1 October to 31 December 2015, by age group

Serotype	Age group			Serotype total*
	Under 5 years	5 to 64 years	Over 65 years	
19A	4	13	13	30
22F	2	14	12	28
3	1	17	10	28
19F	3	8	9	20
23A	3	12	5	20
7F	0	12	4	16
23B	4	5	5	14
11A	0	4	8	12
8	1	7	4	12
9N	0	7	5	12
15A	1	5	5	11
16F	2	2	6	10
35B	0	3	6	9
6C	2	3	3	8
33F	2	2	2	6
12F	1	4	0	5
15C	2	1	2	5
Other	6	22	15	43
Serotype unknown	7	14	6	27
Total	41	155	120	316

* Serotypes that only occur in less than 5 cases per quarter are grouped as Other and include non-typable samples this quarter.

† Serotype unknown includes those serotypes reported as no isolate, not referred, not viable, typing pending and untyped.

Figure 1: Notifications and annual rates* of invasive pneumococcal disease in children aged less than 5 years, Australia, 2004 to 2015, by vaccine serotype group

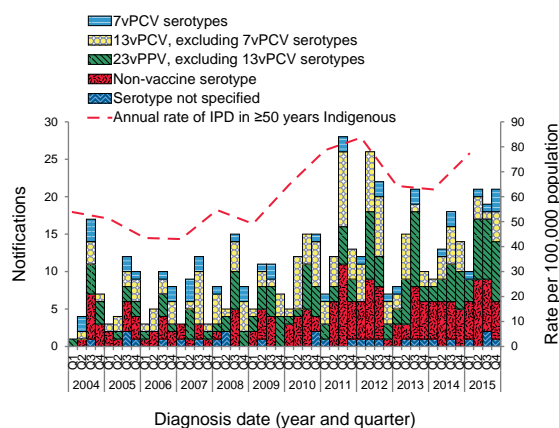


* Annual rates are shown on Q4.

There were 21 cases of IPD reported in Indigenous Australians aged 50 years or over. Of those cases with a reported serotype, 75% (n=15) were due to

a serotype included in the 23-valent polysaccharide pneumococcal vaccine (23vPPV) (Figure 2). The

Figure 2: Notifications and annual rates* of all invasive pneumococcal disease in Indigenous Australians aged 50 years or over, Australia, 2004 to 2015, by vaccine serotype group



* Annual rates are shown on Q4.

Table 3: Notified cases of invasive pneumococcal disease, Australia, 1 October to 31 December 2015, by Indigenous status and age group

Age group	Indigenous status*			Total
	Indigenous	Non-Indigenous	Not reported	
0–4	12	28	1	41
5–9	4	4	2	10
10–14	0	1	1	2
15–19	0	2	1	3
20–24	1	1	4	6
25–29	1	4	1	6
30–34	2	3	4	9
35–39	1	4	9	14
40–44	3	9	4	16
45–49	5	6	5	16
50–54	6	13	0	19
55–59	5	14	0	19
60–64	2	32	1	35
65–69	5	26	1	32
70–74	1	26	0	27
75–79	2	23	0	25
80–84	0	17	0	17
85+	0	19	0	19
Total	50 (16%)	232 (73%)	34 (11%)	316

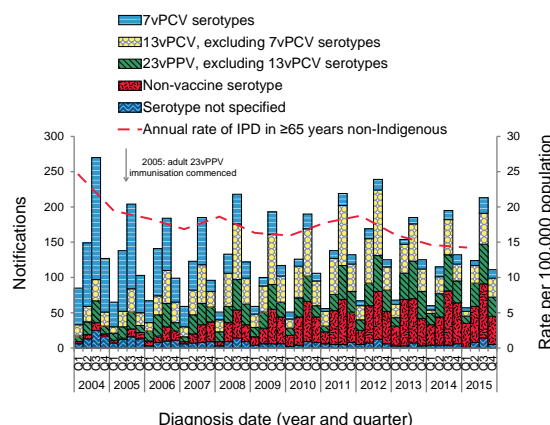
* Indigenous status completeness is defined as the reporting of a known Indigenous status, excluding the reporting of not stated or unknown Indigenous status.

number of notified cases of IPD in this age group was 10% higher than the previous quarter (n=19) and 43% more than the same quarter of 2014 (n=14). Compared with the previous quarter, the proportion of cases due to serotypes included in the 23vPPV increased markedly from 59% to 75%

of cases with a reported serotype. During 2015, the annual rate increased to 77 per 100,000, a 22% increase from the 2014 rate of 63 per 100,000.

There were 111 cases of IPD reported in non-Indigenous Australians aged 65 years or over. Of those cases with a reported serotype, 62% (n=66) were due to a serotype included in the 23vPPV (Figure 3). The number of notified cases of IPD in this age group was 16% less than in the 4th quarter of 2014 (n=132) and 48% lower than the previous quarter (n=213). Compared with the previous quarter, the proportion of IPD due to 23vPPV serotypes increased slightly from 61% to 62% of cases with a reported serotype. In the 2015 calendar year, the annual rate was 14 per 100,000, a 44% reduction from the peak rate of 2004 (25 per 100,000 population) and a small reduction on 2014 (16 per 100,000).

Figure 3: Notifications and annual rates* of all invasive pneumococcal disease in non-Indigenous Australians aged 65 years or over, Australia, 2004 to 2015, by vaccine serotype group



* Annual rates are shown on Q4.

Table 4: Characteristics of 13vPCV failures in children aged less than 5 years, Australia, 1 October to 31 December 2015

Age	Indigenous status	Serotype	Clinical category	Risk factor/s
1 year	Non-Indigenous	19F	Pneumonia	No risk factor identified
1 year	Non-Indigenous	3	Pneumonia	No risk factor identified
2 years	Non-Indigenous	19A	Pneumonia	No risk factor identified
2 years	Non-Indigenous	19A	Pneumonia	Premature and other
3 years	Non-Indigenous	19A	Meningitis	No risk factor identified
2 years	Non-Indigenous	19A	Pneumonia	Childcare attendee and other
4 years	Non-Indigenous	19F	Meningitis	Unknown

In this quarter there were 19 deaths attributed to 14 different IPD serotypes. There were 2 deaths reported in children aged under 5 years that were associated with serotype 19A and 6C respectively.

Notes

The data in this report are provisional and subject to change as laboratory results and additional case information become available. More detailed data analysis of IPD in Australia and surveillance methodology are described in the IPD annual report series published in *Communicable Diseases Intelligence* (CDI).

In Australia, pneumococcal vaccination is recommended as part of routine immunisation for children, the medically at risk, and older Australians. More information on the scheduling of the pneumococcal vaccination can be found on the [Immunise Australia Program web site](http://www.immunise.health.gov.au) (www.immunise.health.gov.au).

In this report, fully vaccinated describes cases that have completed the primary course of the relevant vaccine(s) required for their age according to the most recent edition of *The Australian Immunisation Handbook*, at least 2 weeks prior to disease onset with at least 28 days between doses of vaccine. NB: A young child who has had all the required doses for their age but is not old enough to have completed the primary course would not be classified as fully vaccinated.

There are 4 pneumococcal vaccines available in Australia, each targeting multiple serotypes (Table 5). Note that in this report serotype analysis is generally grouped according to vaccine composition.

Follow-up of all notified cases of IPD is undertaken in all states and territories except New South Wales and Victoria who conduct targeted follow-up of notified cases aged under 5 years, and 50 years or over for enhanced data.

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Table 5: *Streptococcus pneumoniae* serotypes targeted by pneumococcal vaccines

Vaccine type	Serotypes targeted by the vaccine
7-valent pneumococcal conjugate vaccine (7vPCV)	4, 6B, 9V, 14, 18C, 19F and 23F
10-valent pneumococcal conjugate vaccine (10vPCV)	1, 4, 5, 6B, 7F, 9V, 14, 18C, 19F and 23F
13-valent pneumococcal conjugate vaccine (13vPCV)	1, 3, 4, 5, 6A, 6B, 7F, 9V, 14, 18C, 19A, 19F and 23F
23-valent pneumococcal polysaccharide vaccine (23vPPV)	1, 2, 3, 4, 5, 6B, 7F, 8, 9N, 9V, 10A, 11A, 12F, 14, 15B, 17F, 18C, 19F, 19A, 20, 22F, 23F and 33F